



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/511,012

06/13/2005

Masahiro Morooka

S1459.70047US00

6931

23628 7590 11/26/2008  
WOLF GREENFIELD & SACKS, P.C.  
600 ATLANTIC AVENUE  
BOSTON, MA 02210-2206

EXAMINER

TUMMINELLI, ALEXANDER S

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

11/26/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/511,012	<b>Applicant(s)</b> MOROOKA ET AL.	
	<b>Examiner</b> ALEXANDER S. TUMMINELLI	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____.                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____.  | 6) <input type="checkbox"/> Other: ____.                          |

## DETAILED ACTION

### *Response to Amendment*

1. The applicant's amendments filed September 15, 2008 have been entered.  
Claims 1-14 are currently pending in the application.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Takeuchi (JP 08-088030).

Regarding claim 1, Takeuchi teaches an electrolyte comprising an electrolyte composition and a matrix polymer,

- wherein the matrix polymer is a polymer formed by polymerization of a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen (paragraphs [0021] and [0022]).

With regard to the limitation of the polymerization being performed after a precursor for the matrix polymer is brought into contact with a surface on which the electrolyte is to be formed, the lack of physical description in a product-by-process claim makes determination of the patentability of the claim more difficult, since in spite of the fact that the claim may recite only process limitations, it is the patentability of the

Art Unit: 1795

product claimed and not of the recited process steps which must be established. We are therefore of the opinion that when the prior art discloses a product which reasonably appears to be either identical with or only slightly different than a product claimed in a product-by-process claim, a rejection based alternatively on either section 102 or section 103 of the statute is eminently fair and acceptable. As a practical matter, the Patent Office is not equipped to manufacture products by the myriad of processes put before it and then obtain prior art products and make physical comparisons therewith. In re Brown, 459 F.2d 531, 535, 173 USPQ 685, 688 (CCPA 1972).

Regarding claim 2, Takeuchi teaches all of the limitations as stated above. Takeuchi also teaches the electrolyte, wherein the electrolyte composition comprises a solvent to form a gel electrolyte (paragraph [0032]).

Regarding claim 3, Takeuchi teaches all of the limitations as stated above. Takeuchi also teaches the electrolyte, wherein the electrolyte composition comprises no solvent to form a solid electrolyte (paragraph [0033]).

Regarding claim 4, Takeuchi teaches all of the limitations as stated above. Takeuchi also teaches the electrolyte, wherein the electrolyte composition comprises an ionic liquid to form a gel electrolyte (paragraph [0032]).

Regarding claim 5, Takeuchi teaches all of the limitations as stated above. Takeuchi also teaches the electrolyte, wherein the electrolyte composition comprises a redox couple (paragraph [0036]).

Regarding claims 6 and 7, Takeuchi teaches all of the limitations as stated above. Takeuchi also teaches the electrolyte,

Art Unit: 1795

- wherein the redox couple is a combination of a halogen ion and a halide ion (paragraph [0028]), and
- wherein a halogen element portion of the redox couple is iodine (paragraph [0028]).

4. Claims 8-9 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Yonehara et al (JP 2000-306605).

Regarding claims 8 and 9, Yonehara et al teaches a photocell comprising: a semiconductor layer composed of semiconductor particles carrying a dye and an electrolyte layer, the layers being provided between a counter electrode and an electrode formed on a surface of a substrate (paragraph [0108]);

- wherein the electrolyte layer has a redox couple, an electrolyte composition, and a matrix polymer (paragraph [0056]);
- wherein the matrix polymer is a polymer formed by polymerization of a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen (paragraph [0058]); and
- wherein the substrate is a transparent substrate (paragraph [0125]).

Regarding claim 14, Yonehara et al teaches a method for manufacturing a photocell comprising:

- forming a semiconductor layer composed of semiconductor particles carrying a dye between a counter electrode and an electrode formed on a surface of a substrate;

Art Unit: 1795

- applying a first compound having at least two isocyanate groups and a second compound having at least two nucleophilic groups containing active hydrogen; and
- polymerizing the first compound and the second compound (paragraphs [0056] and [0058]).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

Art Unit: 1795

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 10 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi (JP 08-088030).

Regarding claim 10, Takeuchi teaches a method for manufacturing a photocell comprising:

- injecting a mixed solution between a counter electrode and an electrode formed on a surface of a substrate, the mixture containing a first compound having at least two isocyanate groups, a second compound having at least two nucleophilic groups containing active hydrogen, and an electrolyte composition having a redox couple (paragraphs [0021], [0022], and [0036]); and
- polymerizing the first compound and the second compound (paragraph [0023]).

With regard to the limitation of polymerizing the first compound and second compound after the mixed solution is brought into contact with the electrode formed on the surface of the substrate, it is considered by the examiner to be an obvious variation over the method in Takeuchi. There appears to be no patentable distinction between polymerizing the compounds before the solution is brought into contact with the electrode or after.

Regarding claim 12, Takeuchi teaches all of the limitations as stated above.

Takeuchi also teaches the method for manufacturing a photocell, wherein the

Art Unit: 1795

polymerizing is performed in accordance with Michael addition reaction (paragraphs [0025] and [0026]).

Regarding claim 13, Takeuchi teaches all of the limitations as stated above.

Takeuchi also teaches the method for manufacturing a photocell, wherein the electrolyte composition has a redox couple (paragraph [0036]).

9. Claims 10-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yonehara et al (JP 2000-306605).

Regarding claim 10, Yonehara et al teaches a method for manufacturing a photocell comprising:

- injecting a mixed solution between a counter electrode and an electrode formed on a surface of a substrate, the mixture containing a first compound having at least two isocyanate groups, a second compound having at least two nucleophilic groups containing active hydrogen, and an electrolyte composition having a redox couple; and
- polymerizing the first compound and the second compound (paragraphs [0056] and [0058]).

With regard to the limitation of polymerizing the first compound and second compound after the mixed solution is brought into contact with the electrode formed on the surface of the substrate, it is considered by the examiner to be an obvious variation over the method in Takeuchi. There appears to be no patentable distinction between polymerizing the compounds before the solution is brought into contact with the electrode or after.



Regarding claim 11, Yonehara et al teaches all of the limitations as stated above. Yonehara et al also teaches the method for manufacturing a photocell, further comprising forming a semiconductor layer, composed of semiconductor particles carrying a dye, between the electrode and the counter electrode (paragraph [0108]).

Regarding claim 12, Yonehara et al teaches all of the limitations as stated above. Yonehara et al also teaches the method for manufacturing a photocell, wherein the polymerizing polymerization is performed in accordance with Michael addition reaction (paragraphs [0056] and [0058]).

Regarding claim 13, Yonehara et al teaches all of the limitations as stated above. Yonehara et al also teaches the method for manufacturing a photocell, wherein the electrolyte composition has a redox couple (paragraph [0056]).

### ***Response to Arguments***

10. Applicant's arguments filed September 15, 2008 have been fully considered but they are not persuasive. With regard to the applicant's argument that Takeuchi does not teach the polymerization being performed after a precursor for the matrix polymer is brought into contact with a surface on which the electrolyte is formed, the examiner disagrees. While Takeuchi may not explicitly teach that the solid polymer electrolyte is polymerized before or after being in contact with a surface on which the electrolyte is formed, as discussed above, it would be obvious to one of ordinary skill in the art to do so. The mere fact that the pores of a surface would be filled if the polymerization occurs after the solution is in contact with the surface is not patentably distinct over the applied art and would be an obvious variation of the art to one of ordinary skill.

Art Unit: 1795

With regard to the applicant's argument that Yonehara et al fails to disclose a photocell comprising a semiconductor layer and an electrolyte layer, the layers being provided between a counter electrode and an electrode formed on the surface of a substrate, the examiner respectfully disagrees. As stated in the prior action, Yonehara et al teaches a solid polymer electrolyte as well as a semiconductor layer in paragraph [0108]). With regard to the electrodes, they must be present in order for the solar cell to be operable.

### ***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ALEXANDER S. TUMMINELLI whose telephone

Art Unit: 1795

number is (571)270-3878. The examiner can normally be reached on Monday-Thursday, 7:30am-5pm EST, Alt. Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571)272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. S. T./  
Examiner, Art Unit 1795

/Alexa D. Neckel/  
Supervisory Patent Examiner, Art Unit 1795